

REMARKS

In the Office Action, the Examiner rejected claims 1-21 and 39-41. By this paper, the Applicants added new claims 42-46 and amended claims 1, 2, 5, 7, 8, 19, and 39 for clarification of certain features to expedite allowance of the present application. These amendments do not add any new matter. Upon entry of these amendments, claims 1-21 and 39-46 remain pending in the present application and are believed to be in condition for allowance. In view of the foregoing amendments and the following remarks, the Applicants respectfully request reconsideration and allowance of all pending claims.

Claim Rejections under 35 U.S.C. § 112, Second Paragraph

The Examiner rejected claim 8 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which the applicant regards as the invention. As set forth above, the Applicants hereby amend claim 8 to correct the claim dependency from claim 1 to the intended claim 2. In view of this correctional amendment, the Applicants respectfully request withdrawal of the rejection under 35 U.S.C. § 112.

Claim Rejections under 35 U.S.C. § 102

In the Office Action, the Examiner rejected claims 1, 5, and 16 under 35 U.S.C. § 102(b) as anticipated by Ustuner et al. (U.S. Patent No. 6,749,570). The Examiner also rejected claims 1-4, 9, 11-12, and 16 as anticipated by Hanafy (U.S. Patent No. 6,258,034). Applicants respectfully traverse these rejections.

Legal Precedent

First, the pending claims must be given an interpretation that is reasonable and consistent with the *specification*. See *In re Prater*, 415 F.2d 1393, 1404-05, 162 U.S.P.Q. 541, 550-51 (C.C.P.A. 1969) (emphasis added); see also *In re Morris*, 127 F.3d 1048, 1054-55, 44 U.S.P.Q.2d 1023, 1027-28 (Fed. Cir. 1997); see also M.P.E.P. §§ 608.01(o) and 2111. Indeed, the specification is “the primary basis for construing the claims.” See

Phillips v. AWH Corp., No. 03-1269, -1286, at 13-16 (Fed. Cir. July 12, 2005) (*en banc*). One should rely *heavily* on the written description for guidance as to the meaning of the claims. *See id.*

Second, interpretation of the claims must also be consistent with the interpretation that *one of ordinary skill in the art* would reach. *See In re Cortright*, 165 F.3d 1353, 1359, 49 U.S.P.Q.2d 1464, 1468 (Fed. Cir. 1999); M.P.E.P. § 2111. “The inquiry into how a person of ordinary skill in the art understands a claim term provides an objective baseline from which to begin claim interpretation.” *See Collegenet, Inc. v. ApplyYourself, Inc.*, No. 04-1202, -1222, 1251, at 8-9 (Fed. Cir. August 2, 2005) (quoting *Phillips*, No. 03-1269, -1286, at 16). The Federal Circuit has made clear that derivation of a claim term must be based on “usage in the ordinary and accustomed meaning of the words amongst artisans of ordinary skill in the relevant art.” *See id.*

Third, anticipation under section 102 can be found only if a single reference shows exactly what is claimed. *Titanium Metals Corp. v. Banner*, 778 F.2d 775, 227 U.S.P.Q. 773 (Fed. Cir. 1985). For a prior art reference to anticipate under section 102, every element of the claimed invention must be identically shown in a single reference. *In re Bond*, 910 F.2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990). To maintain a proper rejection under section 102, a single reference must teach each and every limitation of the rejected claim. *Atlas Powder v. E.I. du Pont*, 750 F.2d 1569 (Fed. Cir. 1984). Accordingly, the Applicants need only point to a single element not found in the cited reference to demonstrate that the cited reference fails to anticipate the claimed subject matter. The prior art reference also must show the *identical* invention “*in as complete detail as contained in the ... claim*” to support a *prima facie* case of anticipation. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 U.S.P.Q. 2d 1913, 1920 (Fed. Cir. 1989).

Fourth, if the Examiner relies on a theory of inherency, the extrinsic evidence must make clear that the missing descriptive matter is *necessarily* present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. *In re Robertson*, 169 F.3d 743, 49 U.S.P.Q.2d 1949 (Fed. Cir. 1999) (Emphasis Added). The mere fact that a certain thing *may* result from a given set of circumstances is not sufficient. *Id.* In relying upon the theory of inherency, the Examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic *necessarily* flows from the teachings of the applied prior art. *Ex parte Levy*, 17 U.S.P.Q.2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original). The Examiner, in presenting the inherency argument, bears the evidentiary burden and must adequately satisfy this burden. *See id.* Regarding functional limitations, the Examiner must evaluate and consider the functional limitation, just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. *See* M.P.E.P. § 2173.05(g); *In re Swinehart*, 169 U.S.P.Q. 226, 229 (C.C.P.A. 1971); *In re Schreiber*, 44 U.S.P.Q.2d 1429, 1432 (Fed. Cir. 1997). If the Examiner believes the functional limitation to be inherent in the cited reference, then the Examiner “must provide some evidence or scientific reasoning to establish the reasonableness of the examiner’s belief that the functional limitation is an inherent characteristic of the prior art.” *Ex parte Skinner*, 2 U.S.P.Q.2d 1788, 1789 (Bd. Pat. App. & Inter. 1986).

Fifth, the *drawings* of the cited reference must be evaluated for what they *reasonably disclose and suggest* to one of ordinary skill in the art. *In re Aslanian*, 590 F.2d 911, 200 U.S.P.Q. 500 (CCPA 1979). Arguments based on dimensions of the drawing features are of little value where the reference does not disclose specific dimensions or any indication of whether the drawings are to scale. *See Hockerson-Halberstadt, Inc. v. Avia Group Int’l*, 222 F.3d 951, 956, 55 U.S.P.Q.2d 1487, 1491 (Fed. Cir. 2000).

Claim Features Omitted from Ustuner Reference

Turning to the claims, the present amended independent claim 1 recites an “elevationally focused ultrasonic probe comprising an array of MUT cells and a curved member coupled to the array of MUT cells.”

The Ustuner reference fails to teach or suggest “a curved member coupled to the array of MUT cells,” as recited by claim 1. Instead, as cited by the Examiner, the Ustuner reference merely discloses “the transducer 12 is a 2-D array ... having a planar, concave or curved surface.” Ustuner, col. 2, lines 56-58. However, the Ustuner reference does not teach or suggest a curved member as recited by claim 1, much less a curved member that is coupled to the array of MUT cells. Referring generally to FIG. 1 of the Ustuner reference, the transducer 12 clearly has a planar structure and configuration. The only curve shown in FIG. 1 refers to the breast 22 compressed between the transducer 12 and the bottom plate 14. *See* Ustuner, FIG. 1, col. 2, lines 60-64. For at least this reason, the Ustuner reference cannot anticipate independent claim 1 and its dependent claims.

Accordingly, the Applicants respectfully requests withdrawal of the rejection of claims 1, 5, and 16 under 35 U.S.C. § 102 in view of the Ustuner reference.

Claim Features Omitted from Hanafy Reference

Turning to the claims, the present amended independent claim 1 recites an “elevationally focused ultrasonic probe comprising an array of MUT cells and a curved member coupled to the array of MUT cells.”

The Hanafy reference fails to teach or suggest “a curved member coupled to the array of MUT cells,” as recited by claim 1. Instead, the Hanafy reference discloses a PZT layer 114 (not MUT cells) associated with a lens 120. *See* Hanafy, FIG. 1; col. 4, lines 12-16. Although the Hanafy reference briefly mentions cMUTs, the Hanafy reference

does not disclose or suggest any curved member coupled to an array of MUT cells. Instead, the Hanafy reference merely discloses “Single crystal grown transducers and capacitor micro-machined ultrasound transducers (cMUTs) can also be used as the active transducer elements.” Hanafy, col. 10, lines 6-9. In view of the foregoing legal precedent regarding the doctrine of inherency, the Applicants respectfully stress that it does not necessarily flow that the cMUTs would or could be coupled to a lens or curved member in view of the extremely sparse disclosure of cMUTs in the Hanafy reference. Moreover, the Hanafy reference does not enable one of ordinary skill in the art to couple a curved member to an array of MUT cells. As set forth the present application, “since the membranes [of cMUT cells] are delicate, care must be taken during lensing to not damage the cMUT cells.” Application, page 9, lines 25-26. The Hanafy reference does not address the delicate nature of MUT cells, much less a particular technique of coupling a lens to MUT cells. For at least these reasons, the Hanafy reference cannot anticipate independent claim 1 and its dependent claims.

Accordingly, the Applicants respectfully requests withdrawal of the rejection of claims 1-4, 9, 11, 12, and 16 under 35 U.S.C. § 102 in view of the Hanafy reference.

Claim Rejections under 35 U.S.C. § 103(a)

The Examiner rejected claims 6-8, 10, 13-14, 15, 17-20, 21, and 39-41 under 35 U.S.C. § 103(a) as obvious over various combinations of the Hanafy and Ustuner references, and further references including Friemel et al. (U.S. Patent No. 6,537,220), Eaton et al. (U.S. Patent No. 5,876,345), Snow et al. (U.S. Patent No. 6,749,554), Robinson (U.S. Patent No. 6,659,954), Barnes et al. (U.S. Patent No. 6,676,602), and Finsterwald et al. (U.S. Patent No. 5,423,220). The Applicants respectfully traverse these rejections.

Legal Precedent

The burden of establishing a *prima facie* case of obviousness falls on the Examiner. *Ex parte Wolters and Kuypers*, 214 U.S.P.Q. 735 (PTO Bd. App. 1979). Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention absent some teaching or suggestion supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 732 F.2d 1572, 1577, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d. 1430 (Fed. Cir. 1990). Accordingly, to establish a *prima facie* case, the Examiner must not only show that the combination includes *all* of the claimed elements, but also a convincing line of reason as to why one of ordinary skill in the art would have found the claimed invention to have been obvious in light of the teachings of the references. *Ex parte Clapp*, 227 U.S.P.Q. 972 (B.P.A.I. 1985). The Examiner must provide objective evidence, rather than subjective belief and unknown authority, of the requisite motivation or suggestion to combine or modify the cited references. *In re Lee*, 61 U.S.P.Q.2d. 1430 (Fed. Cir. 2002). Moreover, a statement that the proposed modification would have been “well within the ordinary skill of the art” based on individual knowledge of the claimed elements cannot be relied upon to establish a *prima facie* case of obviousness without some *objective reason to combine* the teachings of the references. *Ex parte Levengood*, 28 U.S.P.Q.2d 1300 (Bd. Pat. App. & Inter. 1993); *In re Kotzab*, 217 F.3d 1365, 1371, 55 U.S.P.Q.2d. 1313, 1318 (Fed. Cir. 2000); *Al-Site Corp. v. VSI Int'l Inc.*, 174 F.3d 1308, 50 U.S.P.Q.2d. 1161 (Fed. Cir. 1999).

When prior art references require a selected combination to render obvious a subsequent invention, there must be some reason for the combination other than the hindsight gained from the invention itself, i.e., something in the prior art as a whole must suggest the desirability, and thus the obviousness, of making the combination. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434 (Fed. Cir. 1988). One

cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention. *In re Fine*, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988).

It is improper to combine references where the references teach away from their combination. *In re Grasselli*, 713 F.2d 731, 743, 218 U.S.P.Q. 769, 779 (Fed. Cir. 1983); M.P.E.P. § 2145. Moreover, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *In re Ratti*, 270 F.2d 810, 123 U.S.P.Q. 349 (CCPA 1959); *see* M.P.E.P. § 2143.01(VI). If the proposed modification or combination would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984); *see* M.P.E.P. § 2143.01(V).

In order to rely on equivalence as a rational supporting an obviousness rejection, the equivalency must be recognized in the prior art, and cannot be based on applicant's disclosure or the mere fact that the components at issue are functional or mechanical equivalents. *In re Ruff*, 256 F.2d 590, 118 U.S.P.Q. 340 (CCPA 1958); *see also* M.P.E.P. § 2144.06.

Claims 6-8, 10, 13-14, 15, 17, and 18

As discussed above, the Examiner rejected independent claim 1 as anticipated by either the Ustuner reference or the Hanafy reference. However, these references are both missing features recited in the presently amended claim 1. As noted above, the Examiner rejected claims 6-8, 10, 13-14, 15, 17, and 18 as obvious over the Ustuner and Hanafy references in view of one another or in view of additional references. However, the cited references, taken alone or in hypothetical combination, do not obviate the deficiencies of the Ustuner and Hanafy references as discussed in detail above.

Again, the presently amended independent claim 1 recites an “elevationally focused ultrasonic probe comprising an array of MUT cells and a curved member coupled to the array of MUT cells.” The Ustuner reference merely discloses “the transducer 12 is a 2-D array … having a planar, concave or curved surface” without any mention of a curved member, much less a curved member that is coupled to an array of MUT cells. Ustuner, col. 2, lines 56-58. Moreover, the Hanafy reference discloses a PZT layer 114 (not MUT cells) associated with a lens 120. *See* Hanafy, FIG. 1; col. 4, lines 12-16. The Ustuner and Hanafy references do not obviate the deficiencies of one another. In addition, the other cited references fail to obviate the deficiencies of the Ustuner and Hanafy references. Accordingly, the cited references, taken alone or in hypothetical combination, cannot render independent claim 1 and its dependent claims obvious.

Features of independent claim 19 omitted from cited references

Turning to the claims, the presently amended independent claim 19 recites, *inter alia*, “an array of MUT cells built on said curved substrate and … being disposed on a concave side of said curved substrate; and a layer or protective material applied on the face of said array of MUT cells.”

The cited references, taken alone or in hypothetical combination, fail to teach or suggest “an array of MUT cells built on said curved substrate,” as recited by independent claim 19. Again, the Hanafy reference discloses a PZT layer 114 (not MUT cells) associated with a lens 120. *See* Hanafy, FIG. 1; col. 4, lines 12-16. Although the Hanafy reference briefly mentions cMUTs, the Hanafy reference does not disclose or suggest MUT cells built on a curved substrate. Furthermore, the Barnes and Finsterwald references do not obviate the deficiencies of the Hanafy references. For at least this reason, the Applicants stress that the cited references cannot support a *prima facie* case of obviousness of independent claim 19 and its dependent claims.

The cited references, taken alone or in hypothetical combination, also fail to teach or suggest “a layer or protective material applied on the face of said array of MUT cells,” as recited by independent claim 19. The Hanafy reference discloses a lens 120 and matching layers 116 and 118 without mentioning any sort of protective material, much less a layer of protective material applied on the face of said array of MUT cells. See Hanafy, FIG. 1; col. 4, lines 1-16. Furthermore, the Barnes and Finsterwald references do not obviate the deficiencies of the Hanafy references. For at least this additional reason, the Applicants stress that the cited references cannot support a *prima facie* case of obviousness of independent claim 19 and its dependent claims.

Features of independent claim 39 omitted from cited references

Turning to the claims, the presently amended independent claim 39 recites, *inter alia*, “a curved lens; a first multiplicity of MUT cells hard-wired together and disposed underneath said lens; a second multiplicity of MUT cells hard-wired together and disposed underneath said lens.”

The cited references, taken alone or in hypothetical combination, fail to teach or suggest the foregoing claim features. Again, the Hanafy reference discloses a PZT layer 114 (not MUT cells) associated with a lens 120. See Hanafy, FIG. 1; col. 4, lines 12-16. Although the Hanafy reference briefly mentions cMUTs, the Hanafy reference does not disclose or suggest MUT cells hard-wired together and disposed underneath a lens. Furthermore, the Barnes and Finsterwald references do not obviate the deficiencies of the Hanafy references. For at least this reason, the Applicants stress that the cited references cannot support a *prima facie* case of obviousness of independent claim 39 and its dependent claims.

Accordingly, the Applicants respectfully requests withdrawal of the rejections under 35 U.S.C. § 103.

Lack of Objective Evidence of Reasons to Combine

In addition, the Examiner has not shown the requisite motivation or suggestion to modify or combine the cited references to reach the present claims. As summarized above, the Examiner must provide objective evidence, rather than subjective belief and unknown authority, of the requisite motivation or suggestion to combine or modify the cited references. *In re Lee*, 61 U.S.P.Q.2d. 1430 (Fed. Cir. 2002). In the present Office Action, the Examiner combined the cited references based on *conclusory and subjective statements* with regard to the various rejections. Accordingly, Applicants challenge the Examiner to produce *objective evidence* of the requisite motivation or suggestion to combine the cited references, or remove the foregoing rejections under 35 U.S.C. § 103.

New Claims

As noted above, the Applicants added new claims 42-46. These new claims do not add any new matter, and are believed to be in condition for allowance.

Conclusion

The Applicants respectfully submit that all pending claims should be in condition for allowance. However, if the Examiner believes certain amendments are necessary to clarify the present claims or if the Examiner wishes to resolve any other issues by way of a telephone conference, the Examiner is kindly invited to contact the undersigned attorney at the telephone number indicated below.

Respectfully submitted,



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